W. Hebby M/035/009

State of Utah
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

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April 1, 1993

Mr. Dave Hodson
Barneys Canyon Mine
P.O. Box 311
Bingham Canyon, Ut 84006-0311

RE: Waste Rock Management Plan, Ground Water Discharge Permit No. UGW350001

Dear Mr. Hodson:

We have reviewed the sulfide data and report dated January 28, 1993 from Barneys Canyon Mine. Thank you for the information.

We are concerned that weathering and oxidation of sulfide bearing rock will result in an increase in sulfate and dissolved solids downgradient the mine site, as described in the following 2 equations:

1. $2FeS_2 + 2H_20 + 70_2 \rightarrow 2FeSO_4 + 2H_2SO_4$
2. $H_2SO_4 + CaCO_3 \rightarrow CaSO_4 + H_2CO_3$

The first equation describes the formation of acid (H_2SO_4) by the weathering of pyrite. The second equation describes the neutralization of the acid by reaction with limestone ($CaCO_3$). Your letter suggested there was no problem because there was adequate limestone to neutralize all acid. You are correct in this assumption, but we are also concerned about the sulfate compounds produced by the neutralization of the acid with the limestone in equation 2. Reaction of acid with limestone will produce $CaSO_4$ and the reaction of acid with dolomite will produce $CaSO_4$ and epsom salt (Mg_2SO_4). Both compounds are soluble. It is these compounds which form a leachate which contaminates the ground water. Because the site is a major recharge area for the Salt Lake Valley, precautions must be taken to protect water quality downgradient the site.

Although your reports and data sheets indicate that 5 percent or less of the waste rock is sulfide bearing, it is still appropriate to require that all sulfide waste rock be properly managed if there

is potential for ground water to be contaminated. Ore could either be processed through the proposed crusher if it is implemented, or be properly disposed of to prevent weathering and oxidation. The last option may require ground water discharge permit modification. Therefore, in order to provide better guidance to you in preparation of the waste rock management plan required in the ground water discharge permit, we are requesting you to provide the following information for our study and discussion:

1. What percentage sulfide do you consider to be the dividing line between sulfide and oxidized ore?

2. On the assumption that not all sulfide ore will be processed through the crusher, how do you propose to dispose of the remainder? On the assumption that dumps are the preferred choice, how many dumps would be needed and what would be the approximate volume?

3. What are your proposals for the pit highwalls where sulfide is exposed?

4. What are your proposals for burial and capping of the sulfide waste?

5. What can be done to cover sulfide waste in existing waste dumps?

Should you have questions or wish to have a discussion, please call Mack Croft at 538-6146.

Sincerely,

Fred C. Pehrson, P.E., Manager
Permits, Compliance & Monitoring Branch

FCP:MC:gt/mhf

cc: Kent Miner
Division of Oil, Gas & Mining

P:WRMGMTPL.LTR
FILE:BARNEYS CANYON